User's Manual

EXTECH INSTRUMENTS

Model 407112
Heavy Duty Vane Thermo-Anemometer

Introduction

Congratulations on your purchase of Extech's Heavy Duty Anemometer. The Heavy Duty Anemometer is an instrument used for measuring the speed (velocity) at which air is flowing. Extech's vane anemometers indicate air flow in five units of measure: Feet per minute, Meters per second, Miles per hour, Kilometers per hour, Knots.
Vane anemometers use a remote wheel that freely rotates in response to air flow. In addition to air velocity, Extech's Vane Anemometers measure temperature in both Centigrade and Fahrenheit via a built in thermistor.

Specifications

Circuit	Custom LSI microprocessor circuit.
Display	Dual function , 13 mm(0.5") Super large 1999 count LCD display with contrast adjustment for best viewing angle.
Measurement units	m/s, km/h, ft/min, knots , mph, Temp.- ^{O}C, ^{O}F.,
Data hold	Retain reading in display
Sensor Structure	Air velocity sensor :Conventional twisted vane arms and low-friction ball-bearing design. Temperature sensor :Precision thermistor.
Memory Recall	Records Max, Min and Average readings with RECALL.
Power off	Auto shut off saves battery life, or manual off by push button.
Data Output	RS 232 PC serial interface.
Operating Temp. (instrument only)	0 °C to 50 °C (32 °F to 122 °F).
Operating Humidity	Max. 80% RH.
Power Supply	006P DC 9V battery (Heavy duty type).
Power Current	Approx. DC 8.3 mA.
Weight	0.84 LB / 381 g (included batteries & probe)
Size	Main instrument: 7.1 x 2.8 x1.3 inch (180 x 72 x 32 mm) Sensor Head: Round, 72 mm diameter
Accessories	Instruction manual, Sensor probe

Air Velocity Specifications

Measurement	Range	Resolution	Accuracy (% of full scale)
ft/min (feet/min)	80 - 4921 ft/min	1 ft/min	± (2% + 20ft/min)
m/s (meters/sec)	0.4 - 25.0 m/s	0.1 m/s	± (2% + 1d)
km/h (kilometers/hour)	1.4 - 90.0 km/h	0.1 km/h	
mph (miles/hour)	0.9 - 55.9 mph	0.1 mph	
knots (nautical miles/hour)	0.8 to 48.6 knots	0.1 knots	

Temperature Specifications:

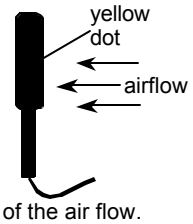
Range (probe only)	Resolution	Accuracy +/-
32^{O}F to 122^{O}F / 0^{O}C to 50^{O}C	0.1^{O}F / 0.1^{O}C	1.5^{O}F / 0.8^{O}C

Meter Description

1. LCD Display
2. Keypad
3. Battery compartment (rear)
4. Sensor input socket
5. RS232 output socket
6. Vane sensor
7. Protective holster

Operation

1. Install the "Sensor Plug" into the "Sensor Input Socket.
2. Press "Power Off/On" to turn the instrument power "ON".
3. Select the temperature units by pressing "°C/ °F ". The display will indicate "°C" or "°F" as selected.
4. Select the air velocity units by pressing "Unit" , The display will indicate "m/s", "km/h", "ft/min", "knot", or "mile/h" as selected.
5. The meter will now display the current temperature and air velocity.



Note: For maximum accuracy in temperature measurements, the yellow dot on the vane should be facing the direction of the air flow.

Data Hold:

During the measurement, pressing "Data Hold" will hold the displayed value and the LCD will display the "D.H" indicator. Press "Hold" again to release the data hold function.

Data Record (MAX/MIN/AVG Readings)

When selected, the DATA RECORD function records and stores the maximum, minimum and average readings. To start the DATA RECORD function:

a) Press "RECORD" once. The "REC" indicator will appear on the display.
b) Press "RECALL" once to retrieve the "Max" reading. The "Max" indicator along with the maximum values will appear on the LCD display.
c) Press "RECALL" once, the "Min" indicator along with the minimum values will appear on the LCD display.
d) Press "RECALL" once, the "AVG" indicator along with the average values will appear on the LCD display.
e) To disable the "Data Record " function, press "Record" again. The display indicators "REC", "Max", "Min", "AVG" will disappear.

Measurement Considerations

1. The meter is designed with an "Auto shut off" feature to save battery life. The power will automatically shut off if no function button is pressed in any 10 minutes period. To disable "Auto shut off" while taking measurements, press "RECORD" and engage the record function.
2. The volume of air flowing through a duct or vent can be determined by taking the area of the duct in square units (i.e. square feet) and multiplying this value by the measured linear velocity (i.e. feet per minute). This gives: ft/min x ft^2 = ft^3/min (CFM)

Battery replacement

The low battery indication appears as a "LBT" on the left corner of the display. When the "LBT" appears, replace the battery as soon as possible. Reliable readings can be obtained for several hours after the first appearance of the low battery indication. To replace the battery:

1 Remover the meter's rubber protective holster.
2 Pry the Battery Cover off using a small coin or screwdriver and remove the battery.
3 Replace the 9V battery (heavy duty type) and reinstall the cover.
4 Make sure the battery cover is secured after changing the battery.

Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for three years from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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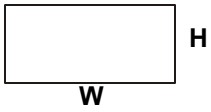
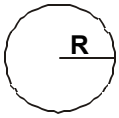
Useful Equations and Conversions

Area equations



A = W x H



A = pi x R^2

Cubic equations

CFM (ft^3/min) = Air Velocity (ft/min) x Area (ft^2)

CMM (m^3/min) = Air Velocity (m/sec) x Area (m^2) x 60

Units Conversion Table

	m/s	ft/min	knots	km/h	MPH
1 m/s	1	196.87	1.944	3.6	2.24
1 ft/min	0.00508	1	0.00987	0.01829	0.01138
1 knot	0.5144	101.27	1	1.8519	1.1523
1 km/h	0.2778	54.69	0.54	1	0.6222
1 MPH	0.4464	87.89	0.8679	1.6071	1

RS232 PC Interface

The meter has a RS232 serial data port. This interface was designed to operate with the Extech Data Acquisition Software (p/n 407000) and enables the user to capture, store and display readings on a PC. For more information, contact Extech or refer to the 407000 user's manual for details on the PC interface.

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